
Bibliography

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[Translation done.]

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Epitome

(57) [Abstract]
[Technical problem] The air conditioner which can prevent fluctuation of a circulation presentation of a refrigerant efficiently by the refrigerating cycle using a non-azeotropy mixing refrigerant is offered.
[Means for Solution] By the refrigerating cycle which consists of a compressor 1, the heat exchanger 2 outside the interior of a room, an expansion valve 7, a receiver 3, and an accumulator 5, between receivers 3 was connected with the accumulator 5 using the by-path pipe 8, and the control valve 9 was formed in the by-path pipe 8.

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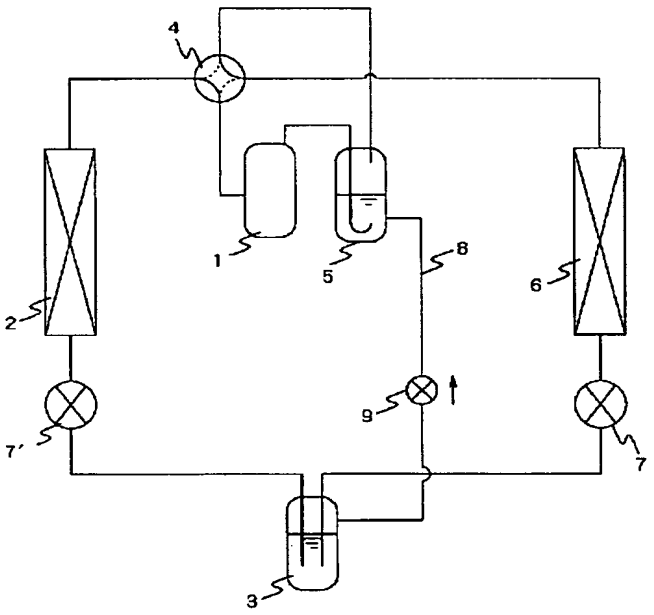
図 1



1…圧縮機 2…室外熱交換器 3…レシーバ 4…四方弁
5…アキュムレータ 6…室内熱交換器 7…膨張弁（7：主、7′：副）
8…バイパス管 9…バイパス弁

[Translation done.]

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The air conditioner characterized by making it come to open and close an epilogue and said bypass valve with the suitable time interval under refrigerating cycle operation with the by-path pipe which forms a receiver in a condenser outlet side and has a bypass valve for said receiver and said accumulator in the air conditioner containing the heat exchanger outside the interior of a room, a compressor, a four way valve, an expansion valve, and an accumulator.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to an air conditioner.
[0002]
[Description of the Prior Art] The typical configuration of the refrigerating cycle of the conventional air conditioner is shown in drawing 4 . That is, a refrigerating cycle becomes with a compressor 1, a four way valve 4, an outdoor heat exchanger 2, an expansion valve 7, indoor heat exchanger 6, and an accumulator 5. An accumulator 5 supplies the refrigerant gas of a suitable dryness fraction to a compressor 1, it is for making breakage of the compressor 1 by liquid compression prevent, and a refrigerant [surplus / in a refrigerating cycle] is accumulated in an accumulator 5.
[0003] Now, as the conventional refrigerant represented in R22, the thing of a single presentation has been used. In this case, the engine performance as refrigerating cycle sufficient with a configuration like drawing 4 was able to be obtained. However, it is determined that R22 currently widely used as for example, an object for refrigerating cycles from the problem of ozone layer depletion will be abolished in 2020. R407C (R32/125/134a=23/25/52wt%) which is a mixed refrigerant as one of the alternative candidates of R22 attracts attention, and researches and developments are furthered that it should apply to an air-conditioning machine. However, since R407C is the mixed refrigerant of non-azeotropy, a circulation presentation in a refrigerating cycle changes with operational status, and it has the problem that performance falls by that cause. When R407C is used by the refrigerating cycle of drawing 2 , more high-boiling point component R134a is stored by the accumulator, and it becomes the presentation by which more R32 which are a component by the side of a low-boiling point, and R125 are contained in the refrigerant which circulates through a refrigerating cycle conversely. Since high-boiling point component R134a is a refrigerant with highest COP while an operating pressure goes up by this, the coefficient of performance (COP) of a refrigerating cycle falls by reduction of R134a. Even if a surplus refrigerant exists, how to hold a surplus refrigerant to a receiver and control

presentation fluctuation as an approach of not producing presentation fluctuation, is also considered (the property of the packaged air-conditioner using trinominal besides Endo, and alternative refrigerant R407C, the Taira Japanese Association of Refrigeration academic lecture meeting lecture collected works in the 7 fiscal year). However, if change, and there is nothing for an accumulator to be more mostly covered with high-boiling point refrigerant R134a and the possibility of breakage of the compressor by liquid compression is considered even if such, an accumulator cannot be removed from a refrigerating cycle.

[0004] Moreover, although switching a four way valve conventionally, making flow of the refrigerant in a cycle reverse, putting hot gas into an outdoor heat exchanger, and taking the frost attached to the outdoor heat exchanger with the heat is often performed in the time of defrosting under heating operation In this case, cold blast comes out from ** indoor heat exchanger, and unpleasant ** defrosting is completed. Even if it resumes heating operation, when four way valves, such as the time of the resumption of ** heating operation out of which a warm wind does not come immediately, are switched, a back flow arises temporarily, a refrigerant flow oscillating sound occurs in piping, and problems, such as being unpleasant, occur.

[0005]

[Problem(s) to be Solved by the Invention] The purpose of this invention is a refrigerating cycle using a non-azeotropy mixing refrigerant like R407C, and is offering the air conditioner which can prevent fluctuation of a circulation presentation of a refrigerant efficiently. Moreover, it is in offering the air conditioner which reduced the displeasure accompanying defrosting operation.

[0006]

[Means for Solving the Problem] This invention prepares the bypass valve which uses a by-path pipe, and connects between an accumulator and receivers, and can control whenever [closing motion] to a by-path pipe, in order to attain the above-mentioned purpose. Furthermore, it was made to make a bypass valve open and close with a suitable time interval.

[0007] Or after carrying out the separation extract of the gas and passing along an auxiliary heat exchanger from the middle of an outdoor heat exchanger, the bypass trajectory which results in an accumulator was established.

[0008] As mentioned above, since the accumulator of the low-tension side is covered with more high-boiling point refrigerant components, the circulation presentation has been shifted to the direction with many low-boiling point components with the non-azeotropy mixing refrigerant. The receiver section has a small dryness fraction and presentation fluctuation seldom takes place. That is, the receiver will be covered with liquid with a rich low-boiling point component. If an accumulator is connected with a receiver using a by-path pipe and a bypass valve is opened at a suitable time interval, a refrigerant can move to a low-pressure accumulator from a high-pressure receiver, and the stagnation presentation in an accumulator can be brought close to an enclosure presentation.

[0009] Furthermore, since it is lost that the flow of the refrigerant at the time of defrosting turns to an interior unit side by being at the defrosting time, shutting the expansion valve by the side of indoor heat exchanger, and opening a bypass valve, various displeasure can be removed.

[0010] Or if gas is separated from the middle of an outdoor heat exchanger, the presentation with many low-boiling point components is acquired, and a circulation presentation can be conversely shifted in the direction with many high-boiling point components. Moreover, the whole presentation balance can be kept good by returning the presentation with many low-boiling point components which carried out the separation extract to the liquid part of an accumulator with a rich high-boiling point component.

[0011]

[Embodiment of the Invention] Drawing 1 explains one example of this invention. The refrigerating cycle is constituted by a compressor 1, a four way valve 4, an outdoor heat exchanger 2, subexpansion valve 7', a receiver 3, the main expansion valve 7, indoor heat exchanger 6, and the accumulator 5. Drawing 1 shows the condition of air conditioning operation, and the hot gas from a compressor 1 goes into an outdoor heat exchanger 2 first. Heating operation can switch a four way valve 4, and can be performed by leading hot gas to indoor heat exchanger 6. In this example, between a receiver 3 and accumulators 5 is combined with a by-

path pipe 8, and the bypass valve 9 is formed in the by-path pipe 8.
[0012] During operation of the refrigerating cycle using a non-azeotropy mixing refrigerant (R407C), refrigerant liquid with a rich high-boiling point component piles up in an accumulator 5, and a circulation presentation and a presentation with a receiver will be in a condition with a rich low-boiling point component conversely. A bypass valve 9 is made to open and close at a suitable time interval by this invention. If a bypass valve 9 is opened, the hot refrigerant gas which was rich in the low-boiling point component of the receiver 3 upper part will be led to an accumulator 5 through a by-path pipe 8. Then, since it mixes with the refrigerant liquid of the low temperature which was rich in the high-boiling point component in an accumulator 5 and condensation of elevated-temperature gas with a rich low-boiling point component takes place, the presentation of the refrigerant liquid in an accumulator can be returned to the thing near an enclosure presentation. Thereby, while decreasing the pressure in a cycle, it comes to raise COP.
[0013] In addition, in this example, in order to extract a refrigerant gas from a receiver 3 fundamentally, there is a merit of not affecting the vaporization ability of the indoor heat exchanger 6 of the downstream at all.
[0014] He switches a four way valve 4 and is trying to lead the hot gas from a compressor 1 to indoor heat exchanger 6 during heating operation. If it is operating for a while, the temperature of an outdoor heat exchanger 2 will fall and frost will come to adhere to the front face. Since heat exchange performance degradation will become remarkable if frost adheres in large quantities, defrosting operation is started. In this example, at the time of defrosting, the main expansion valve 7 by the side of an interior unit is shut, and a bypass valve 9 is opened. When it does in this way, while a refrigerant stops going to an indoor heat exchanger 6 side and the refrigerant flow sound in the sitting-room at the time of defrosting stops occurring, it stops also sensing a feeling of cold blast. Moreover, at this time, since the condition at the time of heating remains in indoor heat exchanger 6 and piping before and behind that, there is an advantage that the interior of a room gets warm immediately after resumption of heating operation. Moreover, since there are few parts which are before and after a switch of a four way valve 4, and the flow direction of a refrigerant reverses, there is a merit of being hard to generate the piping vibration in the time of a switch of a four way valve 4.
[0015] The by-path pipe 8 is connected to a receiver's 3 lower part in the example of drawing 2 . If a bypass valve 9 is opened at a suitable time interval, the refrigerant liquid in the receiver 3 with many low-boiling point components can be mixed with the refrigerant liquid in the accumulator 5 with many high-boiling point components, and the liquid presentation in an accumulator 5 can be brought close to the presentation at the time of enclosure.
[0016] In addition, in this example, since the oil which accumulated in a receiver's 3 pars basilaris ossis occipitalis can also be returned to an accumulator 5 at coincidence, there is a merit which promotes the oil return which is a cycle and raises the dependability of a compressor.
[0017] Drawing 3 shows another example of this invention. Drawing 3 shows the condition of air conditioning operation, and the refrigerating cycle is constituted by a compressor 1, a four way valve 4, an outdoor heat exchanger 2, an expansion valve 7, indoor heat exchanger 6, and the accumulator 5. In this example, the gas part branch 10 is formed in the part of the expansion valve 7 approach of an outdoor heat exchanger 2 so that the separation extract of the refrigerant gas may be carried out, and the auxiliary heat exchanger 11 is connected to the gas part branch 10. Between the auxiliary heat exchanger 11 and the accumulator 5, it connects with the by-path pipe 8 which has a bypass valve 9.
[0018] With such a configuration, if a bypass valve 9 is opened at a suitable time interval, the refrigerant gas which was very rich in the gas presentation in the second half of condensation, i.e., a low-boiling point component, will be extracted by the gas part branch 10 of an outdoor heat exchanger 2. This refrigerant gas flows into an accumulator 5 through the back by-path pipe 8 liquefied by the auxiliary heat exchanger 11. Here, in order are rich in a high-boiling point component and to mix with the stagnation refrigerant in an accumulator 5, the stagnation presentation of the refrigerant in an accumulator 5 can be brought close to a presentation at the time of enclosure. Moreover, by the outdoor heat exchanger 2, since a low-boiling point

component is extracted, the circulation presentation of the refrigerant which flows to indoor heat exchanger 6 also becomes a thing near the presentation at the time of enclosure.
[0019] At the time of heating operation, the refrigerant of low-temperature low voltage flows to an outdoor heat exchanger 2. In the gas part branch 10, the refrigerant gas which was rich in the low-boiling point component is extracted. That is, it comes out from the outlet of an outdoor heat exchanger 2, flows into an accumulator 5, and becomes the component which was rich in a high-boiling point component like high R134a of COP in the main refrigerant path which faces to a compressor 1. On the other hand, the refrigerant gas with the rich low-boiling point component extracted from the gas part branch 10 flows into the liquid side of an accumulator 5 through a by-path pipe 8, and it mixes with refrigerant liquid with the rich high-boiling point component which is piling up there, and the stagnation presentation of an accumulator 5 shifts a part in the direction near an enclosure presentation in order to condense.
[0020]
[Effect of the Invention] According to this invention, the air conditioner which can prevent fluctuation of a circulation presentation of a refrigerant efficiently by the refrigerating cycle using a non-azeotropy mixing refrigerant like R407C can be offered. Moreover, the air conditioner which reduced the various displeasure accompanying defrosting operation can be offered.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The circuit diagram of the refrigerant in which one example of the air conditioner by this invention is shown.
[Drawing 2] The circuit diagram of the refrigerant in which another example of the air conditioner by this invention is shown.
[Drawing 3] The circuit diagram of the refrigerant in which other examples of the air conditioner by this invention are shown.
[Drawing 4] The circuit diagram of the refrigerant of the conventional air conditioner.
[Description of Notations]
1 [-- A four way valve, 5 / -- An accumulator, 6 / -- Indoor heat exchanger, 7 / -- An expansion valve, 8 / -- A by-path pipe, 9 / -- A bypass valve, 10 / -- A gas part branch, 11 / -- Auxiliary heat exchanger.] -- A compressor, 2 -- An outdoor heat exchanger, 3 -- A receiver, 4

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審査請求　未請求　請求項の数１　ＯＬ　（全 ４ 頁）

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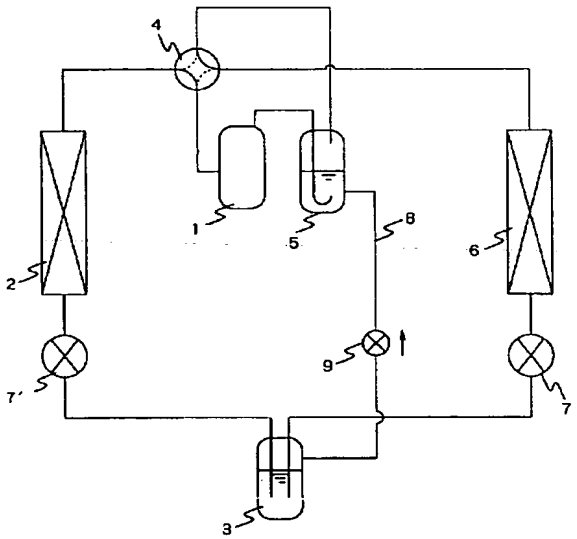
(54)【発明の名称】　空気調和機

(57)【要約】
【課題】非共沸混合冷媒を用いた冷凍サイクルで、冷媒の循環組成の変動を効率的に防止できる空気調和機を提供する。
【解決手段】圧縮機１，室内外熱交換器２，膨張弁７，レシーバ３，アキュムレータ５からなる冷凍サイクルで、アキュムレータ５とレシーバ３の間をバイパス管８を用いて接続し、バイパス管８に制御弁９を設けた。

図 1



1…圧縮機　2…室外熱交換器　3…レシーバ　4…四方弁
5…アキュムレータ　6…室内熱交換器　7…膨張弁（7：主、7′：副）
8…バイパス管　9…バイパス弁

1

【特許請求の範囲】
【請求項１】室内外熱交換器，圧縮機，四方弁，膨張弁及びアキュムレータを含む空気調和機において、凝縮器出口側にレシーバを設け、前記レシーバと前記アキュムレータをバイパス弁を有するバイパス管で結び、前記バイパス弁を冷凍サイクル運転中の適当な時間間隔で開閉させてなることを特徴とする空気調和機。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は空気調和機に関する。
【０００２】
【従来の技術】図４に従来の空気調和機の冷凍サイクルの代表的構成を示す。すなわち、冷凍サイクルは圧縮機１，四方弁４，室外熱交換器２，膨張弁７，室内熱交換器６及びアキュムレータ５によりなる。アキュムレータ５は圧縮機１へ適切な乾き度の冷媒ガスを供給し、液圧縮による圧縮機１の破損を防止させるためのものであり、冷凍サイクル中の余剰な冷媒はアキュムレータ５に蓄積される。
【０００３】さて、従来の冷媒はＲ２２に代表されるように単一組成のものが使用されて来た。この場合には、図４のような構成で十分な冷凍サイクルとしての性能を得ることができた。ところがオゾン層破壊の問題から例えば冷凍サイクル用として広く使用されているＲ２２は２０２０年に全廃されることが決定されている。R22の代替候補の一つとして混合冷媒であるＲ４０７Ｃ（Ｒ３２／１２５／１３４ａ＝２３／２５／５２ｗｔ％）が注目されており、空調機に適用すべく研究開発が進められている。しかし、Ｒ４０７Ｃは非共沸の混合冷媒であるため、冷凍サイクル中での循環組成が運転状態によって変化し、それにより運転性能が低下するという問題がある。図２の冷凍サイクルでＲ４０７Ｃを使用した場合、アキュムレータには高沸点成分Ｒ１３４ａがより多く貯留され、逆に冷凍サイクルを循環する冷媒には低沸点側の成分であるＲ３２やＲ１２５がより多く含まれる組成になる。これにより運転圧力が上昇するとともに高沸点成分Ｒ１３４ａが最もCOPが高い冷媒であるため、Ｒ１３４ａの減少により冷凍サイクルの成績係数(COP)が低下する。余剰冷媒が存在しても組成変動を生じさせない方法として、レシーバに余剰冷媒を保有して組成変動を抑制する方法も考えられている（遠藤ほか３名、代替冷媒Ｒ４０７Ｃを用いたパッケージエアコンの特性、平７年度日本冷凍協会学術講演会講演論文集）。しかし、このようにしてもアキュムレータに高沸点冷媒Ｒ１３４ａがより多くたまることには変りなく、かつ液圧縮による圧縮機の破損の可能性を考えるとアキュムレータは冷凍サイクルから取り除くことはできない。
【０００４】また、暖房運転中の除霜時では、従来四方弁を切り換えてサイクル中の冷媒の流れを逆にし、室外

2

熱交換器にホットガスを入れて、その熱で室外熱交換器についた霜をとることがよく行われているが、この場合、①室内熱交換器から冷風が出て不快である、②除霜が終了し、暖房運転を再開してもすぐに暖かい風が出てこない、③暖房運転再開時など四方弁を切り換えた際に一時的に逆流が生じ、配管中で冷媒流動振動音が発生し、不快な場合がある、などの問題が発生する。
【０００５】
【発明が解決しようとする課題】本発明の目的は、Ｒ４０７Ｃのような非共沸混合冷媒を用いた冷凍サイクルで、冷媒の循環組成の変動を効率的に防止できる空気調和機を提供することである。また、除霜運転に伴う不快感を低減した空気調和機を提供することにある。
【０００６】
【課題を解決するための手段】本発明は、上記目的を達成するために、アキュムレータとレシーバの間をバイパス管を用いて接続し、かつバイパス管に開閉度を制御できるバイパス弁を設けたものである。さらに、バイパス弁を適当な時間間隔で開閉させるようにした。
【０００７】あるいは、室外熱交換器の途中よりガスを分離抽出し、補助熱交換器を通った後にアキュムレータに至るバイパス径路を設けた。
【０００８】前述したように、非共沸混合冷媒では、低圧側のアキュムレータに高沸点冷媒成分が、より多くたまるため、循環組成は低沸点成分が多い方へシフトしている。レシーバ部は乾き度が小さく、組成変動はあまり起らない。すなわち、レシーバには低沸点成分がリッチな液がたまっていることになる。バイパス管を用いてレシーバとアキュムレータを接続し、バイパス弁を適当なタイムインターバルで開くと、高圧のレシーバから低圧のアキュムレータへ冷媒が移動し、アキュムレータ内の滞留組成を、封入組成に近付けることができる。
【０００９】さらに、除霜時で室内熱交換器側の膨張弁を閉めて、バイパス弁を開くことにより、除霜時の冷媒の流れが室内機側へまわることがなくなるため、種々の不快感を取り除くことができる。
【００１０】あるいは、室外熱交換器の途中からガスを分離すると、低沸点成分が多い組成が得られ、逆に循環組成を高沸点成分が多い方向にシフトさせることができる。また、分離抽出した低沸点成分の多い組成を、高沸点成分がリッチなアキュムレータの液部に戻すことにより、全体の組成バランスを良好に保つことができる。
【００１１】
【発明の実施の形態】本発明の一実施例を図１により説明する。冷凍サイクルは圧縮機１，四方弁４，室外熱交換器２，副膨張弁７′，レシーバ３，主膨張弁７，室内熱交換器６及びアキュムレータ５により構成されている。図１は冷房運転の状態を示し、圧縮機１からのホットガスはまず室外熱交換器２に入る。暖房運転は四方弁４を切り換えて、ホットガスを室内熱交換器６へ導くこ

とにより行うことができる。本実施例では、レシーバ３とアキュムレータ５の間をバイパス管８で結合し、バイパス管８にはバイパス弁９が設けられている。

【００１２】非共沸混合冷媒（Ｒ４０７Ｃ）を用いた冷凍サイクルの運転中には、アキュムレータ５に高沸点成分がリッチな冷媒液が滞留し、循環組成及びレシーバでの組成は逆に低沸点成分がリッチな状態となる。本発明では、バイパス弁９を適当なタイムインターバルで開閉させる。バイパス弁９を開くと、レシーバ３上部の低沸点成分に富んだ高温の冷媒ガスがバイパス管８を通ってアキュムレータ５に導かれる。そこでアキュムレータ５内の高沸点成分に富んだ低温の冷媒液と混合し、低沸点成分がリッチな高温ガスの凝縮が起るため、アキュムレータ内の冷媒液の組成を封入組成に近いものに戻すことができる。これにより、サイクル内の圧力を減少させるとともにＣＯＰを向上させるようになる。

【００１３】なお、本実施例では基本的にレシーバ３から冷媒ガスを抜くために、下流側の室内熱交換器６の蒸発性能に何ら影響を与えないというメリットがある。

【００１４】暖房運転中は四方弁４を切り換えて圧縮機１からのホットガスを室内熱交換器６に導くようにしている。しばらく運転していると室外熱交換器２の温度が低下し、その表面に霜が付着するようになる。霜が大量に付着すると熱交換性能の低下が著しくなるため、除霜運転を開始する。本実施例では、除霜時には室内機側の主膨張弁７を閉め、バイパス弁９を開く。このようにすると、室内熱交換器６側へ冷媒が行かなくなり、除霜時における居室内での冷媒流動音が発生しなくなるとともに、冷風感も感じなくなる。またこの時には、室内熱交換器６とその前後の配管内には暖房時の状態が残っているため、暖房運転再開後に室内がすぐに暖まるという利点がある。また、四方弁４の切り換え前後で、冷媒の流れの向きが逆転する個所が少ないために、四方弁４の切り換え時での配管振動が発生しにくいというメリットがある。

【００１５】図２の実施例では、レシーバ３の下部にバイパス管８が接続されている。適当なタイムインターバルでバイパス弁９を開くと、低沸点成分が多いレシーバ３内の冷媒液が、高沸点成分の多いアキュムレータ５内の冷媒液と混合し、アキュムレータ５内の液組成を、封入時の組成に近付けることができる。

【００１６】なお、本実施例ではレシーバ３の底部にたまった油も同時にアキュムレータ５に戻すことができるため、サイクルの油戻りを促進させ圧縮機の信頼性を向上させるメリットがある。

【００１７】図３は本発明の別の実施例を示す。図３は、冷房運転の状態を示し、冷凍サイクルは圧縮機１，四方弁４，室外熱交換器２，膨張弁７，室内熱交換器６

及びアキュムレータ５により構成されている。本実施例では、室外熱交換器２の膨張弁７寄りの部分に、冷媒ガスを分離抽出するようガス分枝部１０が設けられており、ガス分枝部１０には補助熱交換器１１が接続されている。補助熱交換器１１とアキュムレータ５の間は、バイパス弁９を有するバイパス管８で接続されている。

【００１８】このような構成で、バイパス弁９を適当なタイムインターバルで開くと室外熱交換器２のガス分枝部１０では凝縮後半でのガス組成、すなわち低沸点成分に大変富んだ冷媒ガスが抽出される。この冷媒ガスは、補助熱交換器１１で液化された後バイパス管８を通ってアキュムレータ５に流入する。ここで、高沸点成分に富んでアキュムレータ５内の滞留冷媒と混合するために、アキュムレータ５内の冷媒の滞留組成を封入時に組成に近付けることができる。また、室内熱交換器６へ流れる冷媒の循環組成も室外熱交換器２で、低沸点成分が抽出されるため、封入時の組成に近いものとなる。

【００１９】暖房運転時には室外熱交換器２には、低温低圧の冷媒が流れる。ガス分枝部１０では低沸点成分に富んだ冷媒ガスが抽出される。すなわち、室外熱交換器２の出口から出て、アキュムレータ５に流入し、圧縮機１に向かう主たる冷媒経路では、ＣＯＰの高いＲ１３４ａのような高沸点成分に富んだ成分になる。一方、ガス分枝部１０から抽出された低沸点成分がリッチな冷媒ガスは、バイパス管８を経て、アキュムレータ５の液側に流入し、そこに滞留している高沸点成分がリッチな冷媒液と混合し、一部は凝縮するため、アキュムレータ５の滞留組成が、封入組成に近い方向へシフトする。

【００２０】

【発明の効果】本発明によればＲ４０７Ｃのような非共沸混合冷媒を用いた冷凍サイクルで、冷媒の循環組成の変動を効率的に防止できる空気調和機を提供することができる。また、除霜運転に伴う種々の不快感を低減した空気調和機を提供することができる。

【図面の簡単な説明】

【図１】本発明による空気調和機の一実施例を示す冷媒の回路図。

【図２】本発明による空気調和機の別の実施例を示す冷媒の回路図。

【図３】本発明による空気調和機の他の実施例を示す冷媒の回路図。

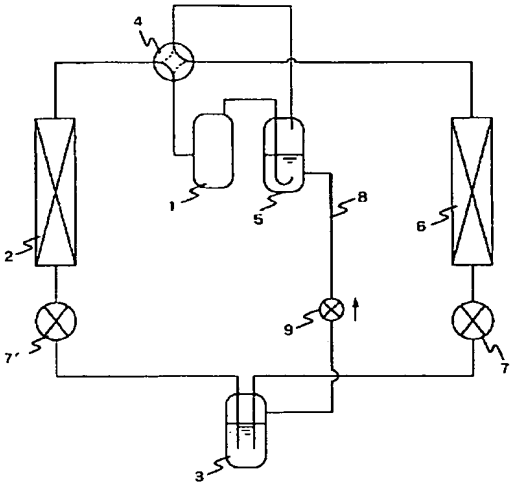
【図４】従来の空気調和機の冷媒の回路図。

【符号の説明】

１…圧縮機、２…室外熱交換器、３…レシーバ、４…四方弁、５…アキュムレータ、６…室内熱交換器、７…膨張弁、８…バイパス管、９…バイパス弁、１０…ガス分枝部、１１…補助熱交換器。

【図１】

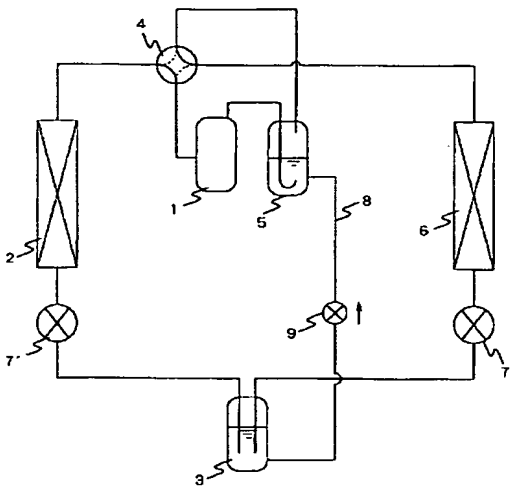
図 1



1…圧縮機　2…室外熱交換器　3…レシーバ　4…四方弁
5…アキュムレータ　6…室内熱交換器　7…膨張弁（7：主、7′：副）
8…バイパス管　9…バイパス弁

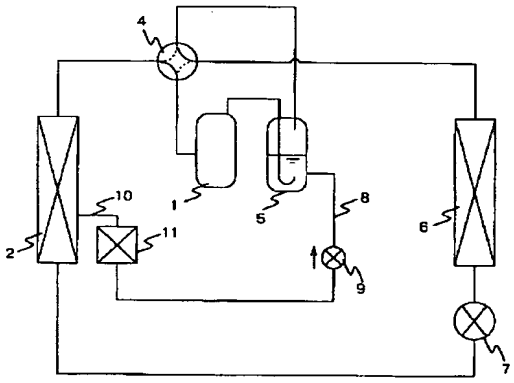
【図２】

図 2



【図３】

図 3



10…ガス分岐部　11…補助熱交換器

【図４】

図 4